BUSSELTON WATER

2021-2022

Annual Water Quality Report

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MESSAGE FROM THE MANAGING DIRECTOR

I am pleased to present the 2021-22 Annual Water Quality Report on behalf of Busselton Water.

Our commitment to compliance with health related and non-health related water quality criteria in the Australian Drinking Water Guidelines (ADWG) is firmly established. Our application of the ADWG is reinforced through our Memorandum of Understanding (MoU) with the Department of Health.

Busselton Water continued to achieve exceptional water quality results in 2021-22 as detailed in this report and summarised in the table below.

In addition to presenting water quality results and performance against the ADWG, this report describes the processes Busselton Water uses to collect, treat and distribute drinking water to our customers.

I wish to thank everyone who has contributed to these excellent results, particularly staff and representatives from the Department of Health and the many contracted companies that support delivery of our services.

Chris Elliott
Managing Director

2021-22 WATER QUALITY RESULTS AT A GLANCE	
Incident management	
Incidents reportable to the Department of Health	Nil
Health related characteristics	**Compliance**
Escherichia coli	100%
Naegleria	100%
Chemical	100%
Pesticides	100%
Radiological	100%
Chlorine Disinfection	100%
Non-health characteristics	**Compliance**
Aesthetic characteristics (excluding chlorine)[1]	99.9%

[1] Busselton Water achieved full compliance with Australian Drinking Water Guidelines except for:
(a) the 0.6 mg/L aesthetic guideline value for chlorine concentration. This aesthetic guideline value is exceeded on some occasions to ensure the microbiological safety of our water supply; and
(b) one pH sample in the Distribution network that was slightly above the ADWG Aesthetic upper limit of 8.5.

OUR COMMITMENT

We are committed to achieving 100 per cent compliance, with health-related and non-health related water quality criteria in the ADWG[2].

To enable us to achieve this, we will:

- systematically monitor and report water quality performance;
- be prepared for incidents including regular testing of our response plans;
- fulfil all the requirements of our Operating Licence and MoU[3] with the Department of Health; and review and implement the Drinking Water Quality Management Plan.

Drinking Water Quality Policy

Busselton Water is committed to providing our current and future customers with high quality, safe drinking water consistent with the ADWG.

In pursuit of our commitments, we will:

• endorse and embrace the ADWG including protection of catchments and sources;

• fulfil all the requirements of our Operating Licence and MoU with the Department of Health;

• maintain and implement a Drinking Water Quality Management System consistent with the 12 elements of the ADWG Framework;

• systematically monitor and report water quality performance;

• prepare for incidents and regularly test our response plans;

• ensure our own water extraction is sustainable; and

• champion protection of source catchments in collaboration with relevant government agencies and regulators.

Drinking Water Quality Management Framework

Busselton Water bases its Drinking Water Quality Management System on the ADWG Framework for Management of Drinking Water Quality, endorsed by the National Health and Medical Research Council. The Framework provides benchmark water quality guidelines and values for designing a structured system for drinking water quality management. It aims to ensure a safe and reliable water supply. There are 12 elements within the ADWG Framework which are considered best practice. These elements are divided into four sections:

1. Commitment to drinking water quality management;

2. System analysis and management;

3. Supporting requirements;

4. Review.

Busselton Water regularly assesses its performance against these elements.

Operating Licence

Our Operating Licence incorporates our MoU with the Department of Health[4].

Memorandum of Understanding

The MoU describes the Department of Health requirements for compliance with the microbiological, health, chemical and radiological criteria. Busselton Water provides the Department of Health with a quarterly water quality report, outlining how our organisation has performed against agreed requirements specified in the MoU. Busselton Water is a member of Western Australia's Advisory Committee for the Purity of Water[5].

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[2] The "Australian Drinking Water Guidelines" published by the National Health and Medical Research Council, Australia's peak health research body, provides an authoritative reference on what defines safe, good quality drinking water; how it can be achieved; and how it can be assured. It is available for download from https://nhmrc.gov.au/about-us/publications/australian-drinking-water-guidelines.

[3] A copy of the Memorandum of Understanding with the Department of Health is available on the Busselton Water website at: https://dyf0dddatui34.cloudfront.net/wp-content/uploads/2020/01/MOU-between-Department-of-Health-and-Busselton-Water-2019.pdf

[4] https://www.erawa.com.au/cproot/21967/2/Water-Services-Licence-3-Version-10-02-June-2021---Busselton-Water-Corporation.pdf

[5] More information on the Advisory Committee for the Purity of Water can be found at More information on the Advisory Committee for the Purity of Water can be found http://ww2.health.wa.gov.au/Articles/A_E_/Advisory-Committee-for-the-Purity-of-Water

OUR GEOGRAPHIC COVERAGE

Current Extent of Operation

Established in 1906, Busselton Water is a local water corporation. We share a 115 year history and culture with the local community. We provide potable water services to more than 28,000 people within the City of Busselton (doubling to more than 60,000 in peak holiday periods). The Water Corporation purchases bulk treated water from Busselton Water to augment supply to Dunsborough.

We currently provide drinking water within a serviced area of 81,200ha, centred around Busselton as shown above. Red, green and blue lines depict water distribution pipes of various sizes, with red being the largest mains pipes and blue being the smallest.

Our Licence Area

A map of our Operating Licence Area can be viewed on the Economic Regulation Authority website[6].

6 https://www.erawa.com.au/cproot/12840/2/Operating%20area%20map%20-%20WL3%20-%20Busselton%20Water.PDF

SYSTEM ANALYSIS AND MANAGEMENT

Our Water Source

Busselton Water sources most of its raw water from the deep, confined, Yarragadee aquifer which extends from about 275 metres to over 800 metres depth. There is some draw from the base of the shallower Leederville aquifer which extends from about 10 to 275 metres in depth.

Busselton Water extracts this raw water under groundwater licences (GWLs) 110850 and 110851, issued by the Department of Water and Environmental Regulation (DWER). There are nine production bores pumping the raw water to treatment plants for aeration, filtration and disinfection before the treated water is stored in tanks and reticulated to customers.

Source protection

Busselton Water, in conjunction with DWER, developed the Busselton Water Reserves Drinking Water Source Protection Plan (Report WRP 139) released by the Department of Water, predecessor of DWER, in August 2013. The Plan defines the boundaries of Busselton Water's Water Reserve and assigns a Priority 1 to these reserves. Ongoing monitoring ensures appropriate actions can be taken to mitigate any risks of contamination.

This identifies that due to the confined nature of this drinking water source, there is very little risk of contamination from overlying land uses. The purpose of proclaiming the water reserves was to ensure the bore locations are under legislative protection.

Busselton Water is also bound by DWER's Groundwater Licence Operating Strategy (GLOS), issued in 2019, stipulating annual extraction entitlement limits, licence conditions and compliance requirements. Busselton Water's consultant Hydrogeologists (Rockwater Pty Ltd) review this document along with the implementation of the borefield construction and maintenance plan, monitoring and reporting requirements to ensure future operational strategies are sustainable in the long term. Extraction of water in accordance with the operating strategy is shown as follows:

ANNUAL GROUNDWATER ABSTRACTED	
Financial Year	Extraction (gigalitres)
2012-2013	4.59
2013-2014	5.05
2014-2015	5.18
2015-2016	5.38
2016-2017	5.15
2017-2018	5.35
2018-2019	5.41
2019-2020	5.60
2020-2021	5.50
2021-2022	6.01

Understanding water quality

Turbidity	Turbidity is the cloudy appearance of water caused by the presence of suspended matter.	The Australian Drinking Water Guidelines specify an aesthetic guideline of 5 Nephelometric Turbidity Units (NTU). If disinfection is required, a turbidity of less than 1 NTU is desirable at the point of disinfection.
Colour	Colour in water originates mainly from natural drainage through soil and vegetation in a catchment.	The Australian Drinking Water Guidelines value for colour is based on the colour that is noticeable in a glass. This is generally accepted as 15 Hazen Units (HU).
Iron	Iron occurs naturally in water as a result of contact with soil or rock in the catchment. Iron in the water does not present a health hazard.	The Australian Drinking Water Guidelines recommend that based on aesthetic consideration, the concentration of Iron should not exceed 0.3 milligrams per Litre (mg/L).
Manganese	Manganese in water can come from contact with soil or rock in the catchment. Manganese is not considered a health concern unless the concentration exceeds 0.5 mg/L.	The Australian Drinking Water Guidelines recommend that based on aesthetic considerations, the levels of Manganese should not exceed 0.1 mg/L.
Total Dissolved Solids	Total dissolved solids (TDS) consist of inorganic (natural) salts and small amounts of organic matter dissolved in water. Total dissolved solids comprise sodium, potassium, calcium, magnesium, chloride, sulphate, bicarbonate, carbonate, silicon, organic matter, fluoride, iron, manganese, nitrate and phosphate.	Treated water quality containing TDS levels of below 500 mg/L is classified as good.
Microbial Pathogens	The most common and widespread health risk associated with drinking water is contamination by microorganisms. Organisms associated with the gut of humans and mammals cause the usual waterborne diseases. Tests are undertaken for *Escherichia coli* (E. coli) as an indicator of microbial contamination. Thermophilic *Naegleria* refers to a group of amoebae which includes *Naegleria fowleri*, the organism that causes the waterborne disease primary amoebic meningoencephalitis. *Naegleria fowleri* is an environmental pathogen which naturally lives in fresh warm water.	The Australian Drinking Water Guidelines state that thermotolerant coliforms / E.coli should not be present in a minimum 100 mL sample of drinking water. The Department of Health WA has notification protocols in place regarding *Naegleria*. Busselton Water is required to immediately notify the Department of Health if *Naegleria* is detected in any microbiological sample.
Radiological	There are natural levels of radiation within the environment, and groundwater sources such as that sourced from the Yarragadee aquifer can have higher background levels than that of surface water systems.	Testing is undertaken for gross alpha and gross beta radioactivity, where screening levels can be determined. The Australian Drinking Water Guidelines recommend a screening level of 0.5 Becquerel per Litre (Bq/L).
pH	pH is a measure of how acidic / basic water is. The range goes from 0 - 14, with 7 being neutral. pH is the measure of free hydrogen ion concentrations in the water.	The suggested aesthetic pH target from the Australian Drinking Water Guidelines is 6.5 to 8.5.

Water Treatment

Busselton Water uses a three-step process to treat raw water from the deep groundwater aquifers to provide customers with safe drinking water.

Pre-oxidation and aeration

Raw water is dosed with a small amount of chlorine, which is a strong oxidizing agent. The water is then aerated through spray nozzles.

These two processes oxidise naturally occurring iron and manganese, turning them from their soluble form into small solids.

Filtration

The pre-chlorinated and aerated water is then filtered through sand filters to remove the iron, manganese, turbidity and other impurities. The filtered water is then collected in a clear-water well.

Disinfection

A further dose of chlorine is added to water pumped from the clear water well. This dose maintains the disinfection level required to preserve microbiological safety before the water is stored in tanks and pumped into the distribution system. Chlorine is approved for use in drinking water supplies and Busselton Water sources chlorine gas from an ISO 9001 accredited manufacturer.

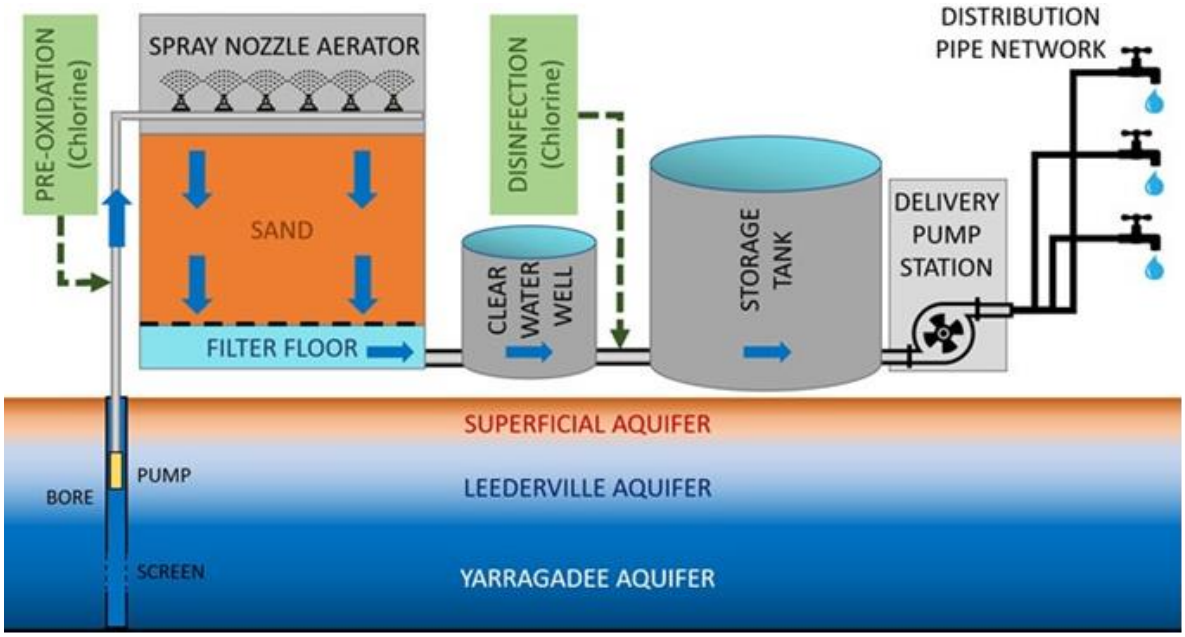
Our Water Treatment Plants

Busselton Water operates three water treatment plants (Plant 1, Plant 2 and Plant 3).

Chlorine disinfection occurs at each treatment plant to keep the concentration of chlorine in the distribution system at or above 0.4 mg/L to ensure adequate protection against Thermophilic *Naegleria* and other microbiological threats. There is also a chlorine disinfection plant located in the distribution network on the trunk main to the Busselton Airport. The ADWG set 5 mg/L of chlorine as the upper acceptable limit.

For further detail please refer to the Chemical Health results section on page 15.

Note: Busselton Water has naturally occurring fluoride in its raw water and does not add fluoride to its drinking water.



Distribution Network

Busselton Water's distribution network delivers drinking water to customers within the City of Busselton and transfers bulk water to neighbouring Dunsborough. The network operates as one large, interconnected system.

Materials used in the reticulation network have been approved either under Australian Standard AS/NZS 4020 (Testing of Products for Use in Contact with Drinking Water) or as scheduled in the MoU with the Department of Health.

Strict protocols established by Busselton Water in conjunction with the Department of Health and the Department of Mines, Industry Regulation and Safety assure the:

- safety and integrity of water distributed to customers;
- safe handling of chlorine at the water treatment plants; and
- safety of chemicals used and materials in contact with drinking water.

DISTRIBUTION NETWORK COMPONENTS	
Estimated population	Approx. 28,000
Total number of connections	14,491
Total length of pipes (km)	345
Number of storage tanks	5
Chlorine residual target	0.4 to 0.6 mg/L
Number of water quality localities	1

Multi-barrier Approach

Preventing contamination and minimising potential hazards is an essential part of providing our customers with safe drinking water. The ADWG require the implementation of a multi-barrier approach as the most effective way of ensuring the safety of drinking water.

Busselton Water's barriers include:

- protection of groundwater;
- treatment;
- chlorine disinfection; and
- backflow prevention.

Busselton Water maintains and operates these multiple barriers, ensuring they are robust and that high-quality drinking water is delivered to our customers.

Incident Responses

While every effort is made to prevent water quality incidents from occurring, there will inevitably be times when our systems fail due to equipment malfunction, human error, extreme weather conditions or unforeseen events.
Busselton Water has incident response plans to manage such events with the minimum possible impact on water quality.

In the event of a water quality incident, Busselton Water activates its Water Quality Incident Response Plan.
This comprehensive plan is applied to manage water quality incidents and is consistent.

Business Continuity

In May 2022, a Water Quality mock event was held with Department of Health participation, which identified some minor improvements, including ensuring that contact details are up to date in emergency response plans and updating of emergency response plans with respect to the Department of Health's latest Amoeba Response Protocol.

COVID-19 impacts were successfully managed to avoid adverse impacts on our delivery of safe drinking water.

Water Quality Monitoring and Testing

Busselton Water has a comprehensive water quality monitoring program which has been reviewed and endorsed by the Department of Health. Key parameters monitored by Busselton Water are:

• microbiological – including Thermophilic *Naegleria* and *Escherichia coli*;

• chemical health – including:

- a large range of parameters with health-related guideline values defined by the ADWG; and

- pesticides which are monitored and tested on an annual basis to monitor the risk of groundwater contamination by pesticides and agricultural chemicals used in proximity to our bores or in the aquifer recharge area;

• chemical non-health (aesthetic) – including a large range of parameters with non-health guideline values defined by the ADWG; and

• radiological health – monitored and tested every two years.

Development, Training and Innovation

Busselton Water utilises training in accordance with the National Water Industry Training package.
Water quality operational staff progress towards Certificate III in Water Industry Operations.

Busselton Water adopts a best practice 70/20/10 development approach.
This approach allocates more time to experiential learning and delivers better employee development and business outcomes. It consists of 70 per cent experiential learning, 20 per cent mentorship of employee learning (including development planning), and 10 per cent approved class-based training. Personnel regularly attend relevant training courses and / or conferences.

Busselton Water continued to derive benefit from innovative detection of backflow from residential customers' properties using radio frequency water meters.

Our Customers

We strive to deliver excellence in customer service and continue to improve our existing levels of customer satisfaction. Busselton Water holds Customer Advisory Group meetings twice per year. Water quality complaints remain at a very low level.

Busselton Water received 14 water quality complaints during 2021-22, with five relating to taste and odour, six relating to discoloured water, and three relating to other issues. This equates to 0.966 complaints per 1,000 properties.

All customer complaints were investigated through personal contact with the customer. All complaints were resolved through either flushing the pipe network in the immediate vicinity of the customer's property or improving the customer's understanding of how drinking water quality is managed.

REVIEW

Busselton Water monitors water quality by taking weekly water samples.

Microbiological Health and Disinfection Results

Busselton Water collected 364 samples from the reticulation system for formal assessment during the reporting period and 100 per cent of these samples were compliant with no detections of either *Escherichia coli* or Thermophilic *Naegleria*. A further 1,683 samples were taken to assess chlorine levels (1,263 in the distribution network and 420 in the storage tanks).

Chemical Health Results

There are many chemical parameters that have health-related guideline values in the ADWG. Busselton Water achieved 100 per cent compliance with all these requirements. The report in the next section gives more detail on the individual parameters.

Perfluoroalkyl and Polyfluoroalkyl substances (PFAS) are a family of manufactured chemicals which do not occur naturally in the environment. They have been identified in the environment at several known and suspected contaminated sites in Western Australia including one in Busselton. No PFAS was detected in Busselton Water's source water when the site was identified and liaison continues with the City of Busselton and the Department of Water and Environmental Regulation regarding their ongoing monitoring and testing.

Radiological Health Results

Groundwater radiological testing is conducted in accordance with parameters and frequencies based on the ADWG and in consultation with the Department of Health. Groundwater radiological testing is only required periodically (i.e., every two years). Gross alpha and gross beta were tested in April 2022 and results from these samples were 100 per cent compliant.

Non-health (Aesthetic) Results

Except for chlorine as described below, Busselton Water achieved 99.9 per cent compliance with non-health (Aesthetic) parameters. One pH sample result was slightly outside the ADWG upper limit of 8.5 and this operational fluctuation is of minor concern with no adverse customer impact.

Busselton Water uses chlorine to provide a disinfectant residual in the water distribution system. Disinfection is designed to kill pathogenic microorganisms, thereby preventing waterborne diseases.

Chlorination is the most commonly used process for disinfection and has been endorsed by the National Health and Medical Research Council for use as a drinking water treatment chemical.

The ADWG state that "In some supplies it may be necessary to exceed the aesthetic guideline in order to maintain an effective disinfectant residual throughout the system." Busselton Water closely manages chlorine dosing levels to maintain a minimum residual chlorine level of 0.4 mg/L throughout the distribution system. During the year, Busselton Water collected 1,633 chlorine samples in the distribution network and 420 in the storage tanks. The minimum total chlorine level was 0.38 mg/L at Apex Rise, and the maximum was 0.90 mg/L at Vernon Track.

There are many parameters with aesthetic guideline values in the ADWG. Results of individual parameters are outlined in the next section of this report.

Visibility of Water Quality Information

Busselton Water understands the importance of holistic catchment to tap risk management processes that focus on the capabilities and resilience of the entire system, not just reactive measures of quality at the point of supply. As a simple example, the "Ten Commandments for Safe Drinking Water" (after Hrudey & Hrudey 2014)[7] is on display at the operational depot as a reminder to staff.

[7] Hrudey S E, Hrudey E J, Ten Commandments For Safe Drinking Water Canadian Water Network 2020, and American Water and Wastewater Association, 2014

WATER QUALITY RESULTS

In the period 1 July 2021 to 30 June 2022, there were no water quality incidents reportable to the Department of Health.

Busselton Water collected 364 free chlorine samples during 2021-22 for formal assessment of our water's chemical health characteristics. An additional 1,683 chlorine (free and total) samples were taken (1,263 in the distribution network and 420 in the storage tanks) during 2021-22 to manage the disinfection performance achieved within the pipe network. The minimum, average and maximum levels of these additional operational samples were:

CHLORINE SAMPLES – 1 JULY 2021 TO 30 JUNE 2022			
TYPE	**Minimum mg/L**	**Average mg/L**	**Maximum mg/L**
Distributed Chlorine (Free)	0.40	0.52	0.79
Distributed Chlorine (Total)	0.38	0.54	0.90

MICROBIOLOGICAL SAMPLES – 1 JULY 2021 TO 30 JUNE 2022										
CHARACTERISTIC	**UNIT**	**ADWG LIMIT**	**Number of Samples**		**Total No. of Samples (Treated + Distribution)**	**Maximum Value**		**Number of Non Compliance with ADWG Limit**		**Compliance % Distribution Water**
			Treated Water (Non-Assessable)	**Distribution Water (Assessable)**		**Treated Water (Non-Assessable)**	**Distribution Water (Assessable)**	**Treated Water (Non-Assessable)**	**Distribution Water (Assessable)**	
Escherichia coli	CFU/100 mL	0	247	364	611	0	0	0	0	100%
Thermophilic *Naegleria*	org/250 mL	ND	247	364	611	ND	ND	0	0	100%
Naegleria fowleri	org/250 mL	ND	0	0	0	-	-	0	0	100%

Note 1 CFU = colony forming units

Note 2 Tests for *Naegleria Fowleri* only required if Thermophilic *Naegleria* is detected.

Note 3 Sampling for *E.Coli* in the Distribution System commenced on 30 March 2010. There has not been an *E.Coli* detection in the Distribution System to date.

Note 4 The last known Thermophilic *Naegleria* detection in the Distribution System was at Vernon Track on 16 August 2011.

RADIOLOGICAL SAMPLES – 1 JULY 2021 TO 30 JUNE 2022										
CHARACTERISTIC	**UNIT**	**ADWG Health Guideline**	**Raw Water (Bores)**				**Treated Water (Storage Tanks)**			
			Non-Compliance (Health)	**No. of Samples**	**% Compliance (Health)**	**Maximum Detected Bq/L**	**Non-Compliance (Health)**	**No. of Samples**	**% Compliance (Health)**	**Maximum Detected Bq/L**
Gross Alpha	Bq/L	0.5	0	7	100%	0.173 ± 0.048	0	5	100%	0.12 ± 0.024
Gross Beta	Bq/L	0.5	0	7	100%	0.219 ± 0.054	0	5	100%	0.25 ± 0.13

Note 1 Bq/L = Becquerel per Litre

CHEMICAL HEALTH - 1 JULY 2021 TO 30 JUNE 2022											
CHARACTERISTIC	UNIT	ADWG Health Guideline	Lab Limit of Reporting (LOR)	Number of Samples		Total No. of Samples (Raw + Distribution)	Maximum Value		Number of Non Compliance with ADWG Health Guideline		Compliance % Distribution Water
				Raw Water	Distribution Water		Raw Water	Distribution Water	Raw Water	Distribution Water	
Antimony	mg/L	0.003	*0.001*	NR	16	16	NR	ND	NR	0	100
Arsenic	mg/L	0.01	*0.001*	NR	16	16	NR	ND	NR	0	100
Barium	mg/L	2	*0.01*	NR	16	16	NR	0.3	NR	0	100
Beryllium	mg/L	0.06	*0.01*	NR	16	16	NR	ND	NR	0	100
Boron	mg/L	4	*0.05*	NR	16	16	NR	0.27	NR	0	100
Bromodichloromethane	mg/L	0.25*	*0.001*	NR	12	12	NR	0.0034	NR	0	100
Bromoform	mg/L	0.25*	*0.001*	NR	12	12	NR	0.012	NR	0	100
Cadmium	mg/L	0.002	*0.0001*	NR	16	16	NR	ND	NR	0	100
Chlorine (Total)	mg/L	5		NR	370	370	NR	0.9	NR	0	100
Chloroform	mg/L	0.25*	*0.001*	NR	12	12	NR	0.0027	NR	0	100
Copper	mg/L	2	*0.001*	NR	15	15	NR	ND	NR	0	100
Dibromochloromethane	mg/L	0.25*	*0.001*	NR	12	12	NR	0.004	NR	0	100
Fluoride	mg/L	1.5	*0.1*	NR	84	84	NR	0.9	NR	0	100
Lead	mg/L	0.01	*0.001*	NR	33	33	NR	ND	NR	0	100
Manganese (Soluble)	mg/L	0.5	*0.01*	87	84	171	0.09	ND	0	0	100
Manganese (Total)	mg/L	0.5	*0.01*	87	84	171	0.09	ND	0	0	100
Mercury	mg/L	0.001	*0.0001*	NR	16	16	NR	ND	NR	0	100
Molybdenum	mg/L	0.05	*0.001*	NR	16	16	NR	0.003	NR	0	100
Nickel	mg/L	0.02	*0.001*	NR	16	16	NR	0.002	NR	0	100
Nitrate-NO3	mg/L	50	*0.05*	30	NR	30	0.13	NR	0	NR	NR
Nitrate-N	mg/L	50	*0.01*	8	NR	8	0.03	NR	0	NR	NR
Nitrite-N	mg/L	3	*0.01*	8	NR	8	ND	NR	0	NR	NR
Nitrite NO2	mg/L	3	*0.05*	30	NR	30	ND	NR	0	NR	NR
Selenium	mg/L	0.01	*0.001*	NR	16	16	NR	ND	NR	0	100
Silver	mg/L	0.1	*0.001*	NR	16	16	NR	ND	NR	0	100
Total Trihalomethanes *	mg/L	0.25*	*0.001*	NR	12	12	NR	0.012	NR	0	100
Uranium	mg/L	0.017	*0.001*	NR	16	16	NR	ND	NR	0	100
TOTAL				**250**	**922**	**1172**			**0**	**0**	**100%**

Note 1 mg/L = milligrams per litre
NTU = Nephelometric turbidity units
ND = Not Detected
NR = Not required to be sampled

Note 2 Chlorine Total is a Busselton Water in-house test. All others are NATA accredited test results. The operating target for residual chlorine in the reticulation system is 0.4 – 0.6 mg/L. Total chlorine levels will be higher than residual levels.

Note 3 The average Chlorine Total level in the Distribution network for the reporting period was 0.54 mg/L.

Note 4 The maximum Chlorine Total level of 0.90 mg/L in the Distribution network for the reporting period was recorded at the Vernon Track sample point on 13 January 2022.

Note 5 Busselton Water does not add fluoride to the water. The naturally occurring fluoride levels vary from bore to bore. The maximum value shown is not indicative of the level throughout the Busselton water supply. Fluoride levels in the drinking water vary with location and time and can be between 0.1 and 0.9 mg/L. The average Fluoride level in the Distribution network for the reporting period was 0.55 mg/L.

Note 6 * The concentration of trihalomethanes, either individually or in total, in drinking water should not exceed 0.25 mg/L.

CHEMICAL HEALTH – PESTICIDES AND HERBICIDES – 1 JULY 2021 TO 30 JUNE 2022

CHARACTERISTIC	UNIT	ADWG Health Guideline	Lab Limit of Reporting (LOR)	Number of Samples	Maximum Value	Number of Non-compliance with ADWG Health Guideline	Compliance %
				Storage Tanks (Drinking Water)			
Acid Herbicides							
Dicamba	µg/L	100	*0.1*	5	ND	0	100%
MCPA	µg/L	40	*0.1*	5	ND	0	100%
2,4-D	µg/L	200	*0.1*	5	ND	0	100%
2,4,5-T	µg/L	100	*0.1*	5	ND	0	100%
2,4,6-T	µg/L	20	*0.1*	5	ND	0	100%
Picloram	µg/L	300	*0.2*	5	ND	0	100%
Fluazifop	µg/L	No Guideline	*0.4*	5	ND	No Guideline	No Guideline
Clopyralid	µg/L	2000	*0.4*	5	ND	0	100%
Metsulfuron Methyl	µg/L	40	*0.5*	5	ND	0	100%
Triclopyr	µg/L	20	*0.1*	5	ND	0	100%
Base Neutral Pesticides							
Diuron	µg/L	20	*0.5*	5	ND	0	100%
Prometryn	µg/L	No Guideline	*0.1*	5	ND	No Guideline	No Guideline
Molinate	µg/L	4	*0.1*	5	ND	0	100%
Terbutryn	µg/L	400	*0.1*	5	ND	0	100%
Fenitrothion	µg/L	7	*0.1*	5	ND	0	100%
Fluometuron	µg/L	70	*0.1*	5	ND	0	100%
Chlorpyrifos	ug/L	10	*0.1*	5	ND	0	100%
Trifluralin	µg/L	90	*0.1*	5	ND	0	100%
Dimethoate	ug/L	7	*0.1*	5	ND	0	100%
Endosulfan I	µg/L	20	*0.1*	5	ND	0	100%
Fenamiphos	µg/L	0.5	*0.1*	5	ND	0	100%
Simazine	µg/L	20	*0.1*	5	ND	0	100%
Atrazine	µg/L	20	*0.1*	5	ND	0	100%
Endosulfan II	µg/L	20	*0.1*	5	ND	0	100%
Endosulfan Sulfate	µg/L	No Guideline	*0.1*	5	ND	No Guideline	No Guideline
Propazine	µg/L	50	*0.1*	5	ND	0	100%
Diclofop Methyl	µg/L	5	*0.1*	5	ND	0	100%
Amitraz	µg/L	9	*0.1*	5	ND	0	100%
Tebuconazole	µg/L	No Guideline	*0.4*	5	ND	No Guideline	No Guideline
Metolachlor	µg/L	300	*0.2*	5	ND	0	100%
Hexazinone	µg/L	400	*0.4*	5	ND	0	100%
Myclobutanil	µg/L	No Guideline	*0.4*	5	ND	No Guideline	No Guideline
Azinphos Methyl	ug/L	30	*1*	5	ND	0	100%
Propiconazole	µg/L	100	*0.4*	5	ND	0	100%
Pesticides							
Aldicarb	µg/L	4	*1*	5	ND	0	100%
Aldicarb Sulfone	µg/L	4	*1*	5	ND	0	100%
Aldicarb Sulfoxide	µg/L	4	*1*	5	ND	0	100%
Aminocarb	µg/L	No Guideline	*1*	5	ND	No Guideline	No Guideline

CHEMICAL HEALTH – PESTICIDES AND HERBICIDES – 1 JULY 2021 TO 30 JUNE 2022							
CHARACTERISTIC	UNIT	ADWG Health Guideline	Lab Limit of Reporting (LOR)	Number of Samples	Maximum Value	Number of Non-compliance with ADWG Health Guideline	Compliance %
				Storage Tanks (Drinking Water)			
Asulam	µg/L	70	*1*	5	ND	0	100%
Bioresmethrin	µg/L	100	*5*	5	ND	0	100%
Bromacil	µg/L	400	*2*	5	ND	0	100%
Carbaryl	µg/L	30	*4*	5	ND	0	100%
Carbendazim	µg/L	90	*1*	5	ND	0	100%
Carbofuran	µg/L	10	*1*	5	ND	0	100%
Chlorantraniliprole	µg/L	6,000	*5*	5	ND	0	100%
Chloroxuron	µg/L	10	*0.4*	5	ND	0	100%
Chlorpropham	µg/L	No Guideline	*2*	5	ND	No Guideline	No Guideline
Cyprodinil	µg/L	90	*1*	5	ND	0	100%
Dichlorprop	µg/L	100	*25*	5	ND	0	100%
Diflubenzuron	µg/L	70	*1*	5	ND	0	100%
Disulfoton	µg/L	4	*1*	5	ND	0	100%
Diuron	µg/L	20	*0.5*	5	ND	0	100%
EPTC	µg/L	300	*5*	5	ND	0	100%
Fenamiphos	µg/L	0.5	*0.1*	5	ND	0	100%
Fenuron/Fenuron TCA	µg/L	No Guideline	*2*	5	ND	No Guideline	No Guideline
Fluometuron	µg/L	70	*1*	5	ND	0	100%
Flupropanate	µg/L	No Guideline	*3*	5	ND	No Guideline	No Guideline
Fosamine	µg/L	30	*10*	5	ND	0	100%
Imazapyr	µg/L	9,000	*1*	5	ND	0	100%
Linuron	µg/L	No Guideline	*5*	5	ND	No Guideline	No Guideline
Methiocarb	µg/L	7	*4*	5	ND	0	100%
Methomyl	µg/L	20	*2*	5	ND	0	100%
Mexacarbate	µg/L	No Guideline	*1*	5	ND	No Guideline	No Guideline
Monuron/Monuron TCA	µg/L	No Guideline	*2*	5	ND	No Guideline	No Guideline
Norflurazon	µg/L	50	*1*	5	ND	0	100%
Omethoate	µg/L	1	*0.1*	5	ND	0	100%
Oryzalin	µg/L	400	*5*	5	ND	0	100%
Oxamyl	µg/L	7	*2*	5	ND	0	100%
Piperonyl butoxide	µg/L	600	*1*	5	ND	0	100%
Pirimicarb	µg/L	7	*0.1*	5	ND	0	100%
Polihexanide	µg/L	700	*100*	5	ND	0	100%
Propachlor	µg/L	70	*1*	5	ND	0	100%
Propham	µg/L	No Guideline	*5*	5	ND	No Guideline	No Guideline
Propoxur	µg/L	No Guideline	*1*	5	ND	No Guideline	No Guideline
Pyrasulfotole	µg/L	40	*5*	5	ND	0	100%
Pyroxsulam	µg/L	4,000	*1*	5	ND	0	100%
Siduron	µg/L	No Guideline	*1*	5	ND	No Guideline	No Guideline
Temephos	µg/L	400	*25*	5	ND	0	100%
Terbacil	µg/L	200	*1*	5	ND	0	100%
Thidiazuron	µg/L	No Guideline	*0.4*	5	ND	No Guideline	No Guideline

CHEMICAL HEALTH – PESTICIDES AND HERBICIDES – 1 JULY 2021 TO 30 JUNE 2022

CHARACTERISTIC	UNIT	ADWG Health Guideline	Lab Limit of Reporting (LOR)	Number of Samples	Maximum Value	Number of Non-compliance with ADWG Health Guideline	Compliance %
				Storage Tanks (Drinking Water)			
Thiobencarb	µg/L	40	*0.4*	5	ND	0	100%
Thiophanate	µg/L	5	*1*	5	ND	0	100%
Thiram	µg/L	7	*2*	5	ND	0	100%
Toltrazuril	µg/L	4	*1*	5	ND	0	100%
Organochlorine Pesticides							
Aldrin	µg/L	0.3	*0.001*	5	ND	0	100%
alpha-BHC (HCH)	µg/L	No Guideline	*0.001*	5	ND	No Guideline	No Guideline
beta-BHC (HCH)	µg/L	No Guideline	*0.001*	5	ND	No Guideline	No Guideline
delta-BHC (HCH)	µg/L	No Guideline	*0.001*	5	ND	No Guideline	No Guideline
Bifenthrin	µg/L	No Guideline	*0.05*	5	ND	No Guideline	No Guideline
Bromophos Ethyl	µg/L	10	*0.005*	5	ND	0	100%
Chlordane	µg/L	2	*0.002*	5	ND	0	100%
Chlorothalonil	µg/L	50	*0.01*	5	ND	0	100%
Chlorpyrifos	µg/L	10	*0.005*	5	ND	0	100%
Diazinon	ug/L	4	*0.01*	5	ND	0	100%
Dieldrin	µg/L	0.3	*0.001*	5	ND	0	100%
Endosulfan I	µg/L	20	*0.001*	5	ND	0	100%
Endosulfan II	µg/L	20	*0.001*	5	ND	0	100%
Endosulfan Sulfate	µg/L	20	*0.001*	5	ND	0	100%
Endrin	µg/L	No Guideline	*0.01*	5	ND	No Guideline	No Guideline
Ethion	ug/L	4	*0.01*	5	ND	0	100%
Fenitrothion	µg/L	7	*0.01*	5	ND	0	100%
Fipronil	µg/L	0.7	*0.02*	5	ND	0	100%
Hexachlorobenzene (HCB)	µg/L	No Guideline	*0.001*	5	ND	No Guideline	No Guideline
Heptachlor Epoxide	µg/L	No Guideline	*0.001*	5	ND	No Guideline	No Guideline
Heptachlor	µg/L	0.3	*0.001*	5	ND	0	100%
Lindane	µg/L	10	*0.001*	5	ND	0	100%
Malathion	µg/L	70	*0.01*	5	ND	0	100%
Methoxychlor	µg/L	30	*0.02*	5	ND	0	100%
o,p-DDT	µg/L	9	*0.001*	5	ND	0	100%
Oxychlordane	µg/L	No Guideline	*0.001*	5	ND	No Guideline	No Guideline
p,p-DDD	µg/L	No Guideline	*0.001*	5	ND	No Guideline	No Guideline
p,p-DDE	µg/L	No Guideline	*0.001*	5	ND	No Guideline	No Guideline
p,p-DDT	µg/L	9	*0.001*	5	ND	0	100%
Parathion Ethyl	µg/L	20	*0.02*	5	ND	0	100%
Parathion Methyl	µg/L	1	*0.02*	5	ND	0	100%
Trifluralin	µg/L	90	*0.01*	5	ND	0	100%
Vinclozolin	µg/L	No Guideline	*0.02*	5	ND	0	
TOTAL				**585**		**0**	**100%**

mg/L milligrams per litre

µg/L micrograms per litre

ND Not Detected

No Guideline No ADWG guideline. Compliance is not required or shown for these analytes/

CHEMICAL HEALTH – VOLATILE ORGANIC COMPOUNDS – 1 JULY 2021 TO 30 JUNE 2022							
CHARACTERISTIC	UNIT	ADWG Health Guideline	Lab Limit of Reporting (LOR)	Number of Samples	Maximum Value	Number of Non-compliance with ADWG Health Guideline	Compliance %
Storage Tanks							
Plasticisers							
Dimethyl phthalate	ug/L	No Guideline	*1*	5	ND	No Guideline	No Guideline
Diethyl phthalate	ug/L	No Guideline	*1*	5	ND	No Guideline	No Guideline
Dibutyl phthalate	ug/L	No Guideline	*1*	5	ND	No Guideline	No Guideline
Benzyl butyl phthalate	ug/L	No Guideline	*1*	5	ND	No Guideline	No Guideline
Di(2-ethylhexyl) adipate	ug/L	10	*1*	5	ND	0	100%
Di(2-ethylhexyl) phthalate	ug/L	10	*1*	5	ND	0	100%
Di-n-Octyl phthalate	ug/L	No Guideline	*1*	5	ND	No Guideline	No Guideline
Volatile Organic Carbons							
Benzene	µg/L	1	*0.5*	5	ND	0	100%
Carbon tetrachloride	µg/L	3	*0.5*	5	ND	0	100%
Chlorobenzene	µg/L	300	*0.5*	5	ND	0	100%
DCM	µg/L	No Guideline	*5*	5	ND	No Guideline	No Guideline
Ethylbenzene	µg/L	300	*0.5*	5	ND	0	100%
Hexachlorobutadiene	µg/L	0.7	*0.5*	5	ND	0	100%
Methyl tert Butyl Ether	µg/L	No Guideline	*0.5*	5	ND	No Guideline	No Guideline
Styrene	µg/L	4	*0.5*	5	ND	0	100%
Perchloroethene (PCE)	µg/L	No Guideline	*0.5*	5	ND	No Guideline	No Guideline
Toluene	µg/L	800	*0.5*	5	ND	0	100%
Trichloroethylene (TCE)	µg/L	No Guideline	*0.5*	5	ND	No Guideline	No Guideline
Vinyl Chloride	µg/L	0.3	*0.2*	5	ND	0	100%
Xylenes (Total)	µg/L	600	*3*	5	ND	0	100%
1,1-Dichloroethane	µg/L	No Guideline	*0.5*	5	ND	No Guideline	No Guideline
1,2-Dichloroethane	µg/L	3	*0.5*	5	ND	0	100%
1,1-Dichloroethene	µg/L	30	*0.5*	5	ND	0	100%
cis-1,2-Dichloroethene	µg/L	60	*0.5*	5	ND	0	100%
trans-1,2-Dichloroethene	µg/L	60	*2*	5	ND	0	100%
1,1,1-Trichloroethane	µg/L	No Guideline	*0.5*	5	ND	No Guideline	No Guideline
1,1,1,2-Tetrachloroethane	µg/L	No Guideline	*0.5*	5	ND	No Guideline	No Guideline
1,1,2,2-Tetrachloroethane	µg/L	No Guideline	*0.5*	5	ND	No Guideline	No Guideline
1,2-Dichlorobenzene	µg/L	1500	*0.5*	5	ND	0	100%
1,3-Dichlorobenzene	µg/L	No Guideline	*0.5*	5	ND	No Guideline	No Guideline
1,4-Dichlorobenzene	µg/L	40	*0.5*	5	ND	0	100%
1,2,3-Trichlorobenzene	µg/L	30	*0.5*	5	ND	0	100%
1,2,4-Trichlorobenzene	µg/L	30	*0.5*	5	ND	0	100%
1,3,5-Trichlorobenzene	µg/L	30	*0.5*	5	ND	0	100%

CHEMICAL HEALTH – 1 JULY 2021 TO 30 JUNE 2022							
CHARACTERISTIC	UNIT	ADWG Health Guideline	Lab Limit of Reporting (LOR)	Number of Samples	Maximum Value	Number of Non-compliance with ADWG Health Guideline	Compliance %
Storage Tanks							
Synthetic Pyrethroids							
Alphamethrin	µg/L	No Guideline	*0.05*	5	ND	No Guideline	No Guideline
Cyfluthrin	µg/L	50	*0.05*	5	ND	0	100%
Cyhalothrin	µg/L	No Guideline	*0.05*	5	ND	No Guideline	No Guideline
Cypermethrin	µg/L	200	*0.05*	5	ND	0	100%
Deltamethrin	µg/L	40	*1*	5	ND	0	100%
Fenvalerate	µg/L	60	*0.05*	5	ND	0	100%
Permethrin	µg/L	200	*0.05*	5	ND	0	100%
Paraquat, Diquat, Amitrole							
Paraquat	µg/L	20	*1*	5	ND	0	100%
Diquat	µg/L	7	*1*	5	ND	0	100%
Amitrole	µg/L	0.9	*0.9*	5	ND	0	100%
Organotins							
Tributyltin	ngSn/L	No Guideline	*2*	5	ND	0	100%
Monobutyltin	ngSn/L	No Guideline	*5*	5	ND	No Guideline	No Guideline
Dibutyltin	ngSn/L	No Guideline	*5*	5	ND	No Guideline	No Guideline
Miscellaneous Organics							
Acrylamide	µg/L	0.2	*0.1*	5	ND	0	100%
Dalapon	µg/L	No Guideline	*2*	5	ND	No Guideline	No Guideline
Ethylenediaminetetraacetic acid (EDTA)	µg/L	250	*20*	5	ND	0	100%
Glyphosate	µg/L	No Guideline	*1*	5	ND	No Guideline	No Guideline
Nitrilotriacetic acid (NTA)	µg/L	200	*20*	5	ND	0	100%
Metals							
Silver - Dissolved	µg/L	100	*0.01*	5	ND	0	100%
Tin - Dissolved	µg/L	No Guideline	*0.01*	5	ND	No Guideline	No Guideline
Iodide	µg/L	500	*0.01*	5	ND	0	100%
TOTAL				**275**		0	100%

µg/L	micrograms per litre
ngSn/L	nanograms per litre
ND	Not Detected
No Guideline	No ADWG guideline. Compliance is not required or shown for these analytes/

CHEMICAL HEALTH - 1 JULY 2021 TO 30 JUNE 2022							
CHARACTERISTIC	UNIT	ADWG Health Guideline	Lab Limit of Reporting (LOR)	Number of Samples	Maximum Value	Number of Non-compliance with ADWG Health Guideline	Compliance %
Distribution Network							
Haloacetic Acids							
Chloroacetic acid	ug/L	150	*2*	1	ND	0	100%
Bromoacetic acid	ug/L	No Guideline	*2*	1	ND	No Guideline	No Guideline
Dichloroacetic acid	ug/L	100	*2*	1	ND	0	100%
Trichloroacetic acid	ug/L	100	*2*	1	ND	0	100%
Bromochloroacetic acid	ug/L	No Guideline	*2*	1	ND	No Guideline	No Guideline
Bromodichloroacetic acid	ug/L	No Guideline	*2*	1	ND	No Guideline	No Guideline
Dibromoacetic acid	ug/L	No Guideline	*2*	1	ND	No Guideline	No Guideline
Dibromochloroacetic acid	ug/L	No Guideline	*5*	1	ND	No Guideline	No Guideline
Tribromoacetic acid	ug/L	No Guideline	*5*	1	ND	No Guideline	No Guideline
Nitrosamines							
N-Nitrosodimethylamine	ng/L	100	*5*	1	ND	0	100%
N-Nitrosomethylethylamine	ng/L	100	*5*	1	ND	0	100%
N-Nitrosodiethylamine	ng/L	100	*5*	1	ND	0	100%
N-Nitrosodipropylamine	ng/L	100	*5*	1	ND	0	100%
N-Nitrosopyrrolidine	ng/L	100	*20*	1	ND	0	100%
N-Nitrosopiperidine	ng/L	100	*5*	1	ND	0	100%
N-Nitrosodibutylamine	ng/L	100	*5*	1	ND	0	100%
Miscellaneous Organics							
Chloral Hydrate	ug/L	100	*2*	1	ND	0	100%
Chloropicrin	ug/L	No Guideline	*1*	1	ND	No Guideline	No Guideline
Low Level PAH							
Naphthalene	ug/L	No Guideline	*0.01*	1	ND	No Guideline	No Guideline
2-Methylnaphthalene	ug/L	No Guideline	*0.01*	1	ND	No Guideline	No Guideline
Acenaphthylene	ug/L	No Guideline	*0.01*	1	ND	No Guideline	No Guideline
Acenaphthene	ug/L	No Guideline	*0.01*	1	ND	No Guideline	No Guideline
Fluorene	ug/L	No Guideline	*0.01*	1	ND	No Guideline	No Guideline
Phenanthrene	ug/L	No Guideline	*0.01*	1	ND	No Guideline	No Guideline
Anthracene	ug/L	No Guideline	*0.01*	1	ND	No Guideline	No Guideline
Fluoranthene	ug/L	No Guideline	*0.01*	1	ND	No Guideline	No Guideline
Pyrene	ug/L	No Guideline	*0.01*	1	ND	No Guideline	No Guideline
Benz(a)anthracene	ug/L	No Guideline	*0.01*	1	ND	No Guideline	No Guideline
Chrysene	ug/L	No Guideline	*0.01*	1	ND	No Guideline	No Guideline
Benzo(b)fluoranthene	ug/L	No Guideline	*0.01*	1	ND	No Guideline	No Guideline
Benzo(k)fluoranthene	ug/L	No Guideline	*0.01*	1	ND	No Guideline	No Guideline
Benzo(a)pyrene	ug/L	0.01	*0.01*	1	ND	0	100%
Indeno(1.2.3-c.d)pyrene	ug/L	No Guideline	*0.02*	1	ND	No Guideline	No Guideline

CHEMICAL HEALTH - 1 JULY 2021 TO 30 JUNE 2022

CHARACTERISTIC	UNIT	ADWG Health Guideline	Lab Limit of Reporting (LOR)	Number of Samples	Maximum Value	Number of Non-compliance with ADWG Health Guideline	Compliance %
Distribution Network							
Dibenz(a.h)anthracene	ug/L	No Guideline	*0.02*	1	ND	No Guideline	No Guideline
Benzo(ghi)perylene	ug/L	No Guideline	*0.02*	1	ND	No Guideline	No Guideline
Metals							
Antimony - Filtered	mg/L	0.003	*0.001*	1	ND	0	100%
Cadmium - Filtered	mg/L	0.002	*0.0001*	1	ND	0	100%
Chromium (VI)	mg/L	0.05	*0.002*	1	ND	0	100%
Copper - Filtered	mg/L	2	*0.001*	1	ND	0	100%
Lanthanum	mg/L	0.002	*0.001*	7	ND	0	100%
Lead - Filtered	mg/L	0.01	*0.001*	1	ND	0	100%
Nickel - Filtered	mg/L	0.02	*0.001*	1	ND	0	100%
Zinc - Filtered	mg/L	3	*0.005*	1	ND	0	100%
Miscellaneous Inorganics							
Bromide	mg/L	No Guideline	*0.1*	7	4.1	No Guideline	No Guideline
Bromate	mg/L	0.02	*0.0005*	7	0.0031	0	100%
Hydrogen Sulfide	mg/L	No Guideline	*0.05*	1	ND	No Guideline	No Guideline
Cyanide - Total	mg/L	0.08	*0.005*	1	ND	0	100%
TOTAL				**68**		**0**	**100%**

mg/L	milligrams per litre
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
mS/cm	MilliSiemens per centimetre
ngSn/L	nanograms per litre
ND	Not Detected
No Guideline	No ADWG guideline. Compliance is not required or shown for these analytes.

PHYSICAL AND CHEMICAL AESTHETIC - 1 JULY 2021 TO 30 JUNE 2022

CHARACTERISTIC	UNIT	ADWG Aesthetic Guideline	Lab Limit of Reporting (LOR)	Number of Samples		Total No. of Samples (Raw + Distribution)	Maximum Value		Number of Non Compliance with ADWG Aesthetic Guideline		Compliance % Distribution Water
				Raw Water	Distribution Water		Raw Water	Distribution Water	Raw Water	Distribution Water	
Alkalinity (Bicarbonate)	mg CaCO3/L	No Guideline	*5*	30	16	46	190	170	No Guideline	No Guideline	No Guideline
Alkalinity (Carbonate)	mg CaCO3/L	No Guideline	*5*	30	16	46	12	12	No Guideline	No Guideline	No Guideline
Alkalinity (Hydroxide)	mg CaCO3/L	No Guideline	*5*	30	16	46	ND	ND	No Guideline	No Guideline	No Guideline
Alkalinity (Total)	mg CaCO3/L	No Guideline	*5*	30	16	46	190	170	No Guideline	No Guideline	No Guideline
Aluminium (Soluble)	mg/L	0.2	*0.1*	30	16	46	ND	ND	0	0	100%
Aluminium (Total)	mg/L	0.2	*0.1*	30	16	46	0.01	ND	0	0	100%
Ammonia as NH3	mg/L	0.5	*0.03*	NR	4	4	NR	0.11	NR	0	100%
Ammonia-N	mg/L	0.5	*0.02*	NR	16	16	NR	0.09	NR	0	100%
Calcium (Dissolved)	mg/L	200	*0.1*	NR	16	16	NR	26	NR	0	100%
Calcium (Total)	mg/L	200	*0.1*	NR	12	12	NR	25	NR	0	100%
Chloride	mg/L	250	*5*	30	NR	30	180	NR	0	NR	NR
Colour True	HU	15	*5*	87	84	171	200	<5	4	0	100%
Electrical Conductivity	µS/cm	No Guideline	*10*	87	84	171	840	790	No Guideline	No Guideline	No Guideline
Filterable Reactive Phosphorus	mg/L	No Guideline	*0.01*	23	NR	23	0.03	NR	No Guideline	NR	NR
Filterable Reactive Phosphorus as PO4	mg/L	No Guideline	*0.05*	22	NR	22	0.05	NR	No Guideline	NR	NR
Hardness	mg CaCO3/L	200	*5*	30	16	46	140	130	0	0	100%
Iron (Soluble)	mg/L	0.3	*0.01*	87	84	171	3.7	0.03	5	0	100%
Iron (Total)	mg/L	0.3	*0.01*	87	84	171	9.6	0.08	62	0	100%
Magnesium (Dissolved)	mg/L	No Guideline	*0.1*	NR	16	16	NR	20	NR	No Guideline	No Guideline
Magnesium (Total)	mg/L	No Guideline	*0.1*	NR	12	12	NR	20	NR	No Guideline	No Guideline
pH	pH	6.5-8.5		87	363	450	8.1	8.6	0	**1**	**99.7%**
Salinity (as Total Dissolved Solids)	mg/L	600	*5*	87	NR	87	500	NR	0	NR	NR
Silica	mg/L	80	*0.1*	30	NR	30	26	NR	0	NR	NR
Sodium	mg/L	180	*0.1*	30	NR	30	120	NR	0	NR	NR
Sulfate	mg/L	250	*1*	30	NR	30	21	NR	0	NR	NR
Turbidity	NTU	5		88	370	458	2.12	0.33	0	0	100%
Zinc	mg/L	3	*0.01*	NR	16	16	NR	ND	NR	0	100%
TOTAL				***985***	***1,273***	***2,258***				**1**	**99.9%**

Note 1:

HU	Hazen Units
NTU	Nephelometric Turbidity Units
mg/L	milligrams per litre
mg CaCO3/L	milligrams per litre as calcium carbonate
uS/cm	microsiemens per centimetre
ND	Not Detected
No Guideline	No ADWG guideline. Compliance is not required or shown for these analytes.
NR	Not required to be sampled

Note 2:. pH and Turbidity are Busselton Water in-house tests. All others are accredited test results.

Note 3: Busselton Water's water supply is sourced from bores constructed in the Leederville and Yarragadee aquifers. The raw groundwater has turbidity, colour and total iron concentrations. Treatment process using aeration, oxidation and filtration readily removes turbidity, colour and total iron before distribution into the reticulation network.

Note 4: One pH result out of 363 pH samples taken in the Distribution Network during 2021/22 exceeded the ADWG aesthetic upper guideline of 8.5. This exceedance was minor (8.6) and is not seen as materially significant to overall water quality.

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